

Claims

1 – 13. (Cancelled)

14. (Original) A method of forming an insulating film on a substrate to reduce nitride consumption during manufacture, the method comprising:

placing a substrate having a nitride layer thereon in a reaction chamber;

providing a silicon source, an oxygen source, a boron source and a phosphorous source for chemical vapor depositing a doped silicate glass layer over the nitride layer;

stabilizing individually the flows of the silicon, oxygen, boron and phosphorous sources prior to providing the sources into the reaction chamber;

injecting the silicon source, the oxygen source and the boron source into the chamber for a predetermined period of time to form a borosilicate glass layer over the nitride layer on the substrate; and

injecting the phosphorous source into the chamber while continuing injecting the silicon, oxygen and boron sources into the chamber to deposit a borophosphosilicate glass layer over the borosilicate glass layer.

15. (Original) The method of claim 14, wherein the predetermined period of time to deposit a borosilicate glass layer over the nitride layer is in a range of approximately 3-30 seconds.

16. (Original) The method of claim 14, wherein the predetermined period of time to deposit a borosilicate glass layer over the nitride layer is about 10 seconds.

17. (Original) The method of claim 14 further comprising annealing the borophosphosilicate glass layer at a temperature in a range of approximately 750° C to 1050°

C in an ambient selected from the group consisting of steam ambient, water ambient and ambient formed by in-situ reaction of H₂ and O₂.

18. (Currently Amended) A method to control nitride consumption during integrated circuit manufacture, the method comprising:

 placing a substrate having a nitride layer in a reaction chamber;
 providing a silicon source, a oxygen source, a boron source and a phosphorous source;
 injecting the silicon, oxygen and boron sources into the reaction chamber while delaying injecting the phosphorous source in the reaction chamber for a predetermined period of time to deposit a boron-rich silicate glass film over the nitride layer, the predetermined period of time selected relative to the desired nitride layer consumption during a subsequent anneal; and

 injecting the phosphorous source in the reaction chamber following the predetermined period of time while continuing injecting the silicon, oxygen and boron sources into the reaction chamber to deposit a borophosphosilicate film over the boron-rich silicate glass film.

19. (Original) The method of claim 18, wherein the predetermined period of time to deposit a boron-rich silicate glass film over the nitride layer is in a range of approximately 3-30 seconds.

Claims 20-22 (Cancelled)